

**Remarks****Preliminary Matters**

Claims 1-45 are presented for reconsideration. Claims 1, 14 and 28 have been amended. New claims 43-45 have been added. No new matter has been introduced. Reconsideration is respectfully requested.

Applicant thanks Examiners Silver and Shah for the courtesy of a telephone interview held 8 January 2009 with Applicant's representative, Daniel Kligler (Reg. No. 41,120), and a subsequent telephone interview between Examiner Silver and Dr. Kligler held 14 January 2009. At the first interview, Dr. Kligler argued the patentability of the claims as previously presented over the cited art (Bugnion). Examiner Shah suggested that the distinction of the claimed invention over the cited art could be clarified by amending the claims to emphasize the separate and independent operation of the first and second virtual machine implementers and of the computers on which the implementers run. Dr. Kligler presented a draft amendment to claim 1 on this basis in the second interview, along with a new claim 43. Examiner Silver agreed that the amended claims would distinguish the invention over the cited art. Applicant has amended the claims accordingly.

**Rejections Under 35 U.S.C. § 102**

Claims 1-9, 11, 13-23, 25, 27-34, and 36-42 were rejected under 35 U.S.C. § 102(b) as being unpatentable over Bugnion, *Disco: Running Commodity Operating Systems on Scalable Multiprocessors* (hereinafter: Bugnion). While disagreeing with

the grounds of the invention, Applicant has amended independent claims 1, 14, and 28, as agreed in the interview, in order to further sharpen the distinction of the claimed invention over the cited art.

Claims 1, 14 and 28 recite that at least first and second virtual machine implementers run respectively on first and second computers, and that a virtual machine is shared between the virtual machine implementers. The claims have been amended to add that the first and second virtual machine implementers run separately and independently of one another on the respective computers. The separateness and independence of these software components is implied clearly throughout the specification and is stated explicitly at several points, for example: "...virtual machine monitors 34, 36... can differ in implementation technique or hardware. For example, the virtual machine monitors 34, 36 could be different products..." (paragraph 0059 in US 2005/0039180, the published version of this application). "The system 10 can be constructed using different types of emulators and different types of virtual machine monitors in many combinations" (paragraph 0060).

By contrast, Bugnion describes a single virtual machine monitor (VMM, known as "Disco"), which runs on a single computer (a shared memory multiprocessor). The Examiner has taken the position that the multiple "processing elements" in Bugnion's computer can be considered equivalent to multiple computers, and that the VMM code that runs on the computer can be considered multiple virtual machine implementers, since different parts of the code may run on different processing elements. Even if this

line of analysis were conceded, for the sake of argument, to be correct, Bugnion's multiple virtual machine implementers would necessarily still be strongly interdependent, and not separate and independent as recited in the amended claims. Therefore independent claims 1, 14 and 28, as amended, are patentable over the cited art.

In view of the patentability of the independent claims, dependent claims 2-9, 11, 13-23, 25, 27-34, and 36-42 are also believed to be patentable.

#### **Rejections Under 35 U.S.C. § 103**

Dependent claims 10, 12, 24, 26, and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bugnion in view of Bugnion (U.S. Patent 6,075,938) and further in view of Official Notice taken. In light of the patentability of independent claims 1, 14 and 28, as amended, dependent claims 10, 12, 24, 26, and 35 are believed to be patentable at least because they depend from an allowable base claim. Applicant further believes that the Official Notice taken by the Examiner was properly traversed in Applicant's previous response, but will reserve argument on this matter in the interest of expediting prosecution.

#### **New Claims**

New dependent claims 43-45 recite features of the hardware structure of the first and second computers of claims 1, 14 and 28. Specifically, claims 43-45 state that the computers have separate interconnect buses between their respective CPUs and I/O devices. This feature is described in paragraph 0066. The interconnection between the CPU and I/O device by the bus in each

of the computers is separate from the other computers, and the address space of each bus is controlled independently by each of the virtual machine monitor in each of the computers. The shared virtual machine causes the guest operating system to see the separate buses as a single address space.

Multiprocessor computers, such as the one described by Bugnion, clearly do not have separate CPUs, I/O devices, and buses respectively connecting them, as recited in claims 43-45. Therefore, claims 43-45 are independently patentable, notwithstanding the patentability of claims 1, 14 and 28.

#### **Concluding Matters**

It is believed that the amendments and remarks presented hereinabove are fully responsive to all the grounds of rejection raised by the Examiner, and that the Application is now in order for allowance.

Applicant thanks the Examiner for his thorough consideration of the Application and appreciates the careful analysis of the art cited therein.

Respectfully submitted,

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